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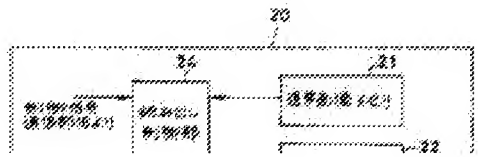
(54) FAST FEED REPRODUCING DEVICE FOR DYNAMIC IMAGE

(57)Abstract:
PURPOSE: To provide a fast feeding reproducing device for a dynamic image not requiring excess data decoding or frame selection processing in response to a reproduction speed.
CONSTITUTION: This reproducing device is provided with a usual image memory 21 storing a usual image formed by consecutive frame groups each consisting of an independent frame and a prescribed number of dependent frames succeeding to the independent frame, a fast feed image memory 22 storing the independent frames only arranged in time series among the consecutive frame groups, a fast rewinding image memory 23 storing the independent frames arranged in reverse time series, and when an instruction of fast feed is received from a terminal equipment section, data are read from the fast feed image memory 22 and when a command of



CLAIMS

[Claim(s)]
[Claim 1]Fast-forwarding-reproduction equipment of video which consists of an independent frame coded by a frame inner code-ized system, and an un-independent frame coded by an inter-frame coding mode characterized by comprising the following.
At least one independent frame.
Dynamic image data for ordinary reproduction formed by continuation of a frame group which consists of a fixed number of un-independent frames following it.
Dynamic image data for a rapid traverse which took out only an independent frame from said frame group, and was arranged and formed in a time series.
A memory measure which memorizes said object for ordinary reproduction, and dynamic image data for said rapid traverse, and a reading control means which carries out selection read-out of said object for ordinary reproduction, or the dynamic image data for said rapid traverse from this memory measure.

[Claim 2]Fast-forwarding-reproduction equipment of said video takes out only an independent frame from said frame group further, and contains dynamic image data already for rewinding arranged and formed in a reverse time series, Said memory measure includes a function to memorize said dynamic image data already for rewinding, And fast-forwarding-reproduction equipment of the video according to claim 1, wherein said reading control means includes a function which carries out selection read-out of any one of said object for ordinary reproduction from said memory measure, said object for a rapid traverse, or said the dynamic image data already for rewinding.
[Claim 3]Fast-forwarding-reproduction equipment of the video according to claim 1 or 2, wherein said reading control means includes a function which reads said dynamic image data to arrangement order of a frame.
[Claim 4]Fast-forwarding-reproduction equipment of the video according to any one of claims 1 to 3 including an image conversion method which changes into an image dynamic image data read from said reading control means, and displays it.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]Especially this invention relates to the fast-forwarding-reproduction equipment of the video which decodes and carries out fast forwarding reproduction of the dynamic image data coded and compressed about the fast-forwarding-reproduction equipment of video.
[0002]
[Description of the Prior Art]The fast-forwarding-reproduction equipment of the video which decodes and carries out fast forwarding reproduction of the data which coded and compressed the dynamic image signal is known.
[0003]Conventionally, two systems, a frame inner code-ized system and an inter-frame coding mode, are known as a coding mode of a picture. To a frame inner code-ized system being what codes the signal for one frame independently, an inter-frame coding mode predicts the signal of the frame which it is going to code from the signal of a previous frame, and codes only an error.
[0004]Since the image data of the frame which continues in an animation especially is alike, correlation is dramatically strong and an inter-frame coding mode is effective for compression of data.
[0005]However, when this inter-frame coding mode tends to decode one certain specific frame out of the continuous frame, all the past data will be needed.
[0006]In order to cancel this fault, the prediction-coding system of the MPEG system is indicated by (1) JP,H2-192378,A and (2) JP,H2-285816,A.
[0007]In these prediction-coding systems, the independent frame coded independently is inserted at arbitrary intervals into the frame by which prediction coding was carried out, and prediction coding is performed based on the independent frame of order.
[0008]Each frame is constituted from I picture (independent frame), P picture, and B picture (un-independent frame) by this MPEG system. Here, since I picture is equivalent to an independent frame, this picture is coded independently. On the other hand, since P picture and B picture are equivalent to an un-independent frame, they cannot be coded independently. For this reason, P picture is coded based on front I picture or P picture, and B picture is coded based on I picture or P picture of order.
[0009]And fast forwarding reproduction was performed, when only I picture took out only P picture or B picture and was reproduced every constant interval out of the continuous frame.
[0010]The fast-forwarding-reproduction system of other MPEG video is indicated by (3) JP,H5-344494,A.

[0011]In this fast-forwarding-reproduction system, every constant interval, the predetermined picture was taken out and it did not reproduce, but I picture (independent frame) near the predetermined picture of a constant interval was chosen, and only that I picture was taken out and it was reproducing.
[0012]
[Problem to be solved by the invention]However, the advanced technology (1) and (2) can be decrypted only with the frame, if the frame to take out is I picture, but when it is P picture or B picture, it will be necessary to also decrypt simultaneously the contiguity frame used on the occasion of the prediction for a decoding.
[0013]In the case of fast forwarding reproduction, it will be necessary to choose the frame which should be displayed every fixed interval according to the speed magnification of a rapid traverse out of the continuous frame. However, this interval of a frame and interval of an independent frame that should be chosen are not necessarily in agreement. For this reason, on the occasion of the fast forwarding reproduction in an MPEG system, from the number of pictures of the frame which should always be displayed, much many pictures had to be decrypted, and the data of every constant interval had to be chosen and displayed from that inside. For this reason, processing became complicated and there was a fault of taking much time.
[0014]In the advanced technology (3), in order to take out only I picture (independent frame), simplification of processing and shortening of processing time are attained from the advanced technology (1) and (2), but. There was a fault that the frame which you want to display needs to perform the selection process of I picture in order to display I picture near it in the case of un-independent frames, such as P picture and B picture, and it did not become fast forwarding reproduction at equal intervals in this case.
[0015]Then, the purpose of this invention is to provide fast-forwarding-reproduction equipment of video which does not need to perform a frame selection process according to a decoding or reproduction speed of excessive data.
[0016]
[Means for solving problem]In order to solve said SUBJECT, this invention is characterized by that fast-forwarding-reproduction equipment of video which consists of an independent frame coded by a frame inner code-ized system and an un-independent frame coded by an inter-frame coding mode comprises:
At least one independent frame.
Dynamic image data for ordinary reproduction formed by continuation of a frame group which consists of a fixed number of un-independent frames following it.
Image data for a rapid traverse which took out only an independent frame from said frame group, and was arranged and formed in a time series.
A memory measure which memorizes said object for ordinary reproduction, and dynamic image data for said rapid traverse, and a reading control means which carries out selection read-out of said object for ordinary reproduction, or the dynamic image data for said rapid traverse from this memory measure.

[0017]
[Function]The video frame for ordinary reproduction is formed by continuation of the frame group which consists of one independent frame and a fixed number of un-independent frames following it, and a memory measure is made to memorize the data for a rapid traverse which took out only the independent frame from this frame and arranged this to the time series. And when performing fast forwarding reproduction, from this memory measure, the data for a rapid traverse is read and it reproduces with usual video playback equipment.
[0018]

[Working example]Hereafter, it explains, referring to an accompanying drawing for the embodiment of this invention. Drawing 1 is a block diagram of one embodiment of the fast-forwarding-reproduction equipment of the video concerning this invention. The fast-forwarding-reproduction equipment of this video is equipment used for multimedia communication, Reproduction mode is chosen by the user and it consists of the terminal part 1 to which reproduction of video is performed in the mode according to that selection, and the multimedia communication server part (henceforth a server part) 20 which transmits predetermined video to the terminal 1 with the directions from this terminal part 1.

[0019]In order for the terminal part 1 to make the dynamic image data of predetermined reproduction mode transmit to the server part 20 according to the directions from the host CPU 2 which executes a program according to a user's directions, and the host CPU 2, The control signal transmission section 3 which transmits a control signal to the server part 20, and the system-data treating part 4 which classifies the data transmitted from the server part 20 to a header (time code), a picture, a sound, etc., The image data storage 5 which stores the image data outputted from the system-data treating part 4, The decode part 6 which decrypts the image data stored in the image data storage 5, NTSC encoder 7 which changes into an NTSC signal the image data decrypted by the decode part 6, It consists of CPU bus 9 connected between the image display 8 which displays the image data changed into the NTSC signal with NTSC encoder 7, the host CPU 2 and the control signal transmission section 3, the system-data treating part 4, and the decode part 6.

[0020]Next, the composition of a server part is explained. Drawing 2 is a block diagram of one embodiment of a server part. The usual image memory 21 the server part 20 remembers the dynamic image data for ordinary reproduction to be, the video for rewinding is already remembered to be the rapid-traverse image memory 22 which memorizes the dynamic image data for a rapid traverse -- with the rewinding image memory 23 already. It consists of the reading control part 24 which reads predetermined dynamic image data from any one of these three memories 21-23 according to the control signal from the control signal communications department 3, and is transmitted to the system-data treating part 4.

[0021]Although not illustrated, these three memories 21-23 are constituted from memories (RAM etc.) which can be written, By equipping this server part 20 with the publicly known writing control part which writes predetermined dynamic image data in these memories 21-23 further, the fast forwarding reproduction of the newest dynamic image data, etc. become possible.

[0022]Next, the data structure of dynamic image data is explained. Drawing 3 is a ** type explanatory view showing the data structure of dynamic image data.

[0023]GOP1 is shown and 1 frame group The top I picture I00 (independent frame), And it comprises a total of 15 pictures of the P picture P03 by which prediction coding was carried out, P06, P09, P0C and the B picture B01, B02, B04, B05, B07, B08, B0A, B0B, B0D, and B0E. Here, although the number of pictures of GOP1 is set to 15 as a general numerical value, arbitrary numbers may be sufficient as it. Although a cycle of I and P picture is set to 3, numbers also with this arbitrary may be sufficient as it.

[0024]Dynamic image data for ordinary reproduction comprises a thing (GOP1, GOP2, --GOPN;N are two or more positive integers) which this 1 frame group was made to follow.

[0025]GOP is the abbreviation for Group of Pictures here, GOP means a data structure which made image data of several sheets a bundle, I picture means a frame inner code-ized picture, P picture means an inter-frame forward direction prediction-coding picture, and B picture means an inter-frame bidirectional prediction-coding picture, respectively.

[0026]Dynamic image data for a rapid traverse follows a time series, and arranges GOP1 - the I picture (independent frame) I00 in data of GOPN, I10, --IN0.

[0027]And dynamic image data for rewinding already arranges dynamic image data for a rapid traverse in order of IN0, --, I10, and I00 conversely.

[0028]Next, operation of fast-forwarding-reproduction equipment of video is explained.

[0029]First, operation of a fast-forwarding-reproduction display is explained. Drawing 4 is a ** type explanatory view showing operation timing of a fast-forwarding-reproduction display. The figure shows operation timing of the server part 20, the terminal part 1, the image data storage 5, and the image display 8 sequentially from the left, and it is shown that time advances caudad from the upper part of the figure. S11-S16 which were described in a proper place show each operation step. G1-G5 show the frame group GOP 1-5, i.e., dynamic image data for ordinary reproduction, and I2-I4 show the I pictures I20-I40, i.e., dynamic image data for a rapid traverse.

[0030]If fast forwarding reproduction is chosen from a user during ordinary reproduction now, the host CPU 2 of the terminal part 1 will send a control signal for a rapid traverse to the server part 20 via the control signal communications department 3 (S11), The host CPU 2 issues directions of a halt immediately after that at the decode part 6, and makes a display by the image display 8 suspend. The data G2 of the image data storage 5 is canceled almost simultaneously with this (S12). Data in which a slash part of G2 was canceled is shown, and G2 which adjoins a slash part shows data just before being canceled.

[0031]Next, the server part 20 which received a control signal from the control signal communications department 3 switches data transmitting to data for a rapid traverse from GOP data, and transmits it to the terminal part 1. At this time, the reading control part 24 has transmitted to the system-data treating part 4 in order of I3 and I4 within the server part 20 by making the I picture I2 corresponding to a time series (old order), i.e., G2, for data for a rapid traverse into a head.

[0032]The host CPU 2 checks that data for a rapid traverse has been sent by the system-data treating part 4, cancels a halt, carries out the same processing as ordinary reproduction, and displays data for a rapid traverse on the image display 8 (S13).

[0033]If ordinary reproduction is chosen by user as for release of fast forwarding reproduction, the host CPU 2 via the control signal communications department 3, Sending a fast-forwarding-reproduction release signal to the server part 20 (S14) after that, the host CPU 2 makes the decode part 6 suspend a display, and cancels the data I4 of the image data storage 5 (S15).

[0034]Next, the server part 20 changes data transmitting into G4 to the G0P data I4 which is equal to a frame present on display from rapid-traverse data, i.e., I picture, and transmits it to the terminal part 1. And after the host CPU 2 checks that data for ordinary reproduction has been sent by the system-data treating part 4 and cancels a halt, it displays an image for ordinary reproduction on an image display again (S16). And an image for ordinary reproduction of G5 and -- to order is displayed after G4.

[0035]Thus, since a rapid traverse is started by making the I picture I2 corresponding to G2 halted into a head and ordinary reproduction is started by making G4 corresponding to I4 halted into a head, A bond from ordinary reproduction to fast forwarding reproduction and a bond from fast forwarding reproduction to ordinary reproduction can be performed comfortable visually.

[0036]Next, operation of a rewinding reproduction display is already explained. Drawing 5 is a ** type explanatory view already showing operation timing of a rewinding reproduction display. Since meanings, such as the display G, I, and S in the figure, are the same as that of drawing 4, explanation is omitted.

[0037]If rewinding reproduction is already chosen from a user during ordinary reproduction now, the host CPU 2 of the terminal part 1 will already send a control signal for rewinding to the server part 20 via the control signal communications department 3 (S21), The host CPU 2 issues directions of a halt immediately after that at the decode part 6, and makes a display by the image display 8 suspend. The data G7 of the image data storage 5 is canceled almost simultaneously with this (S22). Data in which a slash part of G7 was canceled is shown, and G7 which adjoins a slash part shows data just before being canceled.

[0038]Next, the server part 20 which received the control signal from the control signal communications department 3 already switches data transmitting to the data for rewinding from GOP data, and transmits it to the terminal part 1. At this time, the reading control part 24 has already transmitted to the

system-data treating part 4 in order of I5 and I4 from the reverse time series (new order), i.e., G7, within the server part 20 by making the I picture I6 corresponding to the GOP data G6 in front of one for the data for rewinding into a head.
[0039]The host CPU 2 checks that the data for rewinding has already been sent by the system-data treating part 4, cancels a halt, carries out the same processing as ordinary reproduction, and already displays the data for rewinding on the image display 8 (S23).
[0040]If ordinary reproduction is already chosen by the user as for release of rewinding, the host CPU 2 via the control signal communications department 3, Already sending a rewinding release signal to the server part 20 (S24) after that, the host CPU 2 makes the decode part 6 suspend a display, and cancels the data I4 of the image data storage 5 (S25).
[0041]Next, the server part 20 changes data transmitting into the GOP data G6 in front of [of G7 already canceled by S22 from rewinding data] one, and transmits it to the terminal part 1. And after the host CPU 2 checks that the data for ordinary reproduction has been sent by the system-data treating part 4 and cancels a halt, it displays the image for ordinary reproduction on an image display again (S26). And the image for the ordinary reproduction of G7 and -- to order is displayed after G6.
[0042]Thus, since rewinding is already started by making the I picture I6 corresponding to G6 in front of [of Ghalted 7] one into a head and a change to ordinary reproduction from rewinding is already performed from G6 in front of a rewinding start, from ordinary reproduction -- already -- a bond to rewinding reproduction -- and a bond from rewinding reproduction to ordinary reproduction can already be performed comfortable visually.
[0043]Although the number of pictures of GOP was constituted from a 15-sheet lot at this example, it can perform a rapid traverse or already gathering rewinding speed by reducing this number of sheets a rapid traverse or by already being able to lower rewinding speed and increasing the number of sheets of GOP contrary to this.
[0044]
[Effect of the Invention]The dynamic image data for ordinary reproduction formed by continuation of the frame group which consists of at least one independent frame and a fixed number of un-independent frames following it in this invention, The dynamic image data for a rapid traverse which took out only the independent frame from said frame group, and was arranged and formed in the time series, Since the memory measure which memorizes both these data, and the reading control means which reads one of data from this memory measure were established, when fast forwarding, the dynamic image data for a rapid traverse is read from a memory measure, and that read data is processed with the equipment for ordinary reproduction as it is. Therefore, fast forwarding reproduction can be performed.
Fast forwarding reproduction at equal intervals can also be performed easily.
[0045]Therefore, since it becomes unnecessary to perform a frame selection process according to a decoding and reproduction speed of excessive data, reduction of circuit structure and clear-ization of a reproduced image can be attained.

[Translation done.]

TECHNICAL FIELD

[Industrial Application]Especially this invention relates to the fast-forwarding-reproduction equipment of the video which decodes and carries out fast forwarding reproduction of the dynamic image data coded and compressed about the fast-forwarding-reproduction equipment of video.

[Translation done.]

PRIOR ART

[Description of the Prior Art]The fast-forwarding-reproduction equipment of the video which decodes and carries out fast forwarding reproduction of the data which coded and compressed the dynamic image signal is known.
[0003]Conventionally, two systems, a frame inner code-ized system and an inter-frame coding mode, are known as a coding mode of a picture. To a frame inner code-ized system being what codes the signal for one frame independently, an inter-frame coding mode predicts the signal of the frame which it is going to code from the signal of a previous frame, and codes only an error.
[0004]Since the image data of the frame which continues in an animation especially is alike, correlation is dramatically strong and an inter-frame coding mode is effective for compression of data.
[0005]However, when this inter-frame coding mode tends to decode one certain specific frame out of the continuous frame, all the past data will be needed.
[0006]In order to cancel this fault, the prediction-coding system of the MPEG system is indicated by (1) JP,H2-192378,A and (2) JP,H2-285816,A.
[0007]In these prediction-coding systems, the independent frame coded independently is inserted at arbitrary intervals into the frame by which prediction coding was carried out, and prediction coding is performed based on the independent frame of order.
[0008]Each frame is constituted from I picture (independent frame), P picture, and B picture (un-independent frame) by this MPEG system. Here, since I picture is equivalent to an independent frame, this picture is coded independently. On the other hand, since P picture and B picture are equivalent to an un-independent frame, they cannot be coded independently. For this reason, P picture is coded based on front I picture or P picture, and B picture is coded based on I picture or P picture of order.
[0009]And fast forwarding reproduction was performed, when only I picture took out only P picture or B picture and was reproduced every constant interval out of the continuous frame.
[0010]The fast-forwarding-reproduction system of other MPEG video is indicated by (3) JP,H5-344494,A.
[0011]In this fast-forwarding-reproduction system, every constant interval, the predetermined picture was taken out and it did not reproduce, but I picture (independent frame) near the predetermined picture of a constant interval was chosen, and only that I picture was taken out and it was reproducing.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention]The dynamic image data for ordinary reproduction formed by continuation of the frame group which consists of at least one independent frame and a fixed number of un-independent frames following it in this invention, The dynamic image data for a rapid traverse which took out only the independent frame from said frame group, and was arranged and formed in the time series, Since the memory measure which memorizes both these data, and the reading control means which reads one of data from this memory measure were established, when fast forwarding, the dynamic image data for a rapid traverse is read from a memory measure, and that read data is processed with the equipment for ordinary reproduction as it is. Therefore, fast forwarding reproduction can be performed.
Fast forwarding reproduction at equal intervals can also be performed easily.
[0045]Therefore, since it becomes unnecessary to perform a frame selection process according to a decoding and reproduction speed of excessive data, reduction of circuit structure and clear-ization of a reproduced image can be attained.

[Translation done.]

TECHNICAL PROBLEM

[Problem to be solved by the invention]However, the advanced technology (1) and (2) can be decrypted only with the frame, if a frame to take out is I picture, but when it is P picture or B picture, it will be necessary to also decrypt simultaneously a contiguity frame used on the occasion of prediction for a decoding.
[0013]In the case of fast forwarding reproduction, it will be necessary to choose a frame which should be displayed every fixed interval according to speed magnification of a rapid traverse out of a continuous frame. However, this interval of a frame and interval of an independent frame that should be chosen are not necessarily in agreement. For this reason, on the occasion of fast forwarding reproduction in an MPEG system, from the number of pictures of a frame which should always be displayed, much many pictures had to be decrypted, and data of every constant interval had to be chosen and displayed from that inside. For this reason, processing became complicated and there was a fault of taking much time.
[0014]In advanced technology (3), in order to take out only I picture (independent frame), simplification of processing and shortening of processing time are attained from advanced technology (1) and (2), but. There was a fault that a frame which you want to display needs to perform a selection process of I picture in order to display I picture near it in the case of un-independent frames, such as P picture and B picture, and it did not become fast forwarding reproduction at equal intervals in this case.
[0015]Then, the purpose of this invention is to provide the fast-forwarding-reproduction equipment of the video which does not need to perform the frame selection process according to a decoding or reproduction speed of excessive data.

[Translation done.]

MEANS

[Means for solving problem]In order to solve said SUBJECT, this invention is characterized by that the fast-forwarding-reproduction equipment of the video which consists of an independent frame coded by the frame inner code-ized system and an un-independent frame coded by the inter-frame coding mode comprises:
At least one independent frame.
Dynamic image data for ordinary reproduction formed by continuation of the frame group which consists of a fixed number of un-independent frames following it.
Image data for a rapid traverse which took out only the independent frame from said frame group, and was arranged and formed in the time series.
The memory measure which memorizes said object for ordinary reproduction, and the dynamic image data for said rapid traverse, and the reading control means which carries out selection read-out of said object for ordinary reproduction, or the dynamic image data for said rapid traverse from this memory measure.

[Translation done.]

OPERATION

[Function]The video frame for ordinary reproduction is formed by continuation of the frame group which consists of one independent frame and a fixed number of un-independent frames following it, and a memory measure is made to memorize the data for a rapid traverse which took out only the independent frame from this frame and arranged this to the time series. And when performing fast forwarding reproduction, from this memory measure, the data for a rapid traverse is read and it reproduces with usual video playback equipment.

[Translation done.]

EXAMPLE

[Working example]Hereafter, it explains, referring to an accompanying drawing for an embodiment of this invention. Drawing 1 is a block diagram of one embodiment of fast-forwarding-reproduction equipment of video concerning this invention. Fast-forwarding-reproduction equipment of this video is equipment used for multimedia communication, Reproduction mode is chosen by user and it consists of the terminal part 1 to which reproduction of video is performed in a mode according to that selection, and the multimedia communication server part (henceforth a server part) 20 which transmits predetermined video to the terminal 1 with the directions from this terminal part 1.
[0019]In order for the terminal part 1 to make dynamic image data of predetermined reproduction mode transmit to the server part 20 according to directions from the host CPU 2 which executes a program according to a user's directions, and the host CPU 2, The control signal transmission section 3 which transmits a control signal to the server part 20, and the system-data treating part 4 which classifies data transmitted from the server part 20 to a header (time code), a picture, a sound, etc., The image data storage 5 which stores image data outputted from the system-data treating part 4, The decode part 6 which decrypts image data stored in the image data storage 5, NTSC encoder 7 which changes into an NTSC signal image data decrypted by the decode part 6, It consists of CPU bus 9 connected between the image display 8 which displays image data changed into an NTSC signal with NTSC encoder 7, the host CPU 2 and the control signal transmission section 3, the system-data treating part 4, and the decode part 6.
[0020]Next, composition of a server part is explained. Drawing 2 is a block diagram of one embodiment of a server part. The usual image memory 21 the server part 20 remembers dynamic image data for ordinary reproduction to be, video for rewinding is already remembered to be the rapid-traverse image memory 22 which memorizes dynamic image data for a rapid traverse -- with the rewinding image memory 23 already. It consists of the reading control part 24 which reads predetermined dynamic image data from any one of these three memories 21-23 according to a control signal from the control signal communications department 3, and is transmitted to the system-data treating part 4.
[0021]Although not illustrated, these three memories 21-23 are constituted from memories (RAM etc.) which can be written, By equipping this server part 20 with a publicly known writing control part which writes predetermined dynamic image data in these memories 21-23 further, fast forwarding reproduction of the newest dynamic image data, etc. become possible.
[0022]Next, a data structure of dynamic image data is explained. Drawing 3 is a ** type explanatory view showing a data structure of dynamic image data.
[0023]GOP1 is shown and 1 frame group The top I picture I00 (independent frame), And it comprises a total of 15 pictures of the P picture P03 by which prediction coding was carried out, P06, P09, P0C and the B picture B01, B02, B04, B05, B07, B08, B0A, B0B, B0D, and B0E. Here, although the number of pictures of GOP1 is set to 15 as a general numerical value, arbitrary numbers may be sufficient as it. Although the cycle of I and P picture is set to 3,

numbers also with this arbitrary may be sufficient as it.
[0024]The dynamic image data for ordinary reproduction comprises a thing (GOP1, GOP2, --GOPN;N are two or more positive integers) which this 1 frame group was made to follow.
[0025]GOP is the abbreviation for Group of Pictures here, GOP means the data structure which made the image data of several sheets the bundle, I picture means a frame inner code-ized picture, P picture means an inter-frame forward direction prediction-coding picture, and B picture means an inter-frame bidirectional prediction-coding picture, respectively.
[0026]The dynamic image data for a rapid traverse follows a time series, and arranges GOP1 - the I picture (independent frame) I00 in the data of GOPN, I10, --IN0.
[0027]And dynamic image data for rewinding already arranges dynamic image data for a rapid traverse in order of IN0, --, I10, and I00 conversely.
[0028]Next, operation of fast-forwarding-reproduction equipment of video is explained.
[0029]First, operation of a fast-forwarding-reproduction display is explained. Drawing 4 is a ** type explanatory view showing operation timing of a fast-forwarding-reproduction display. The figure shows operation timing of the server part 20, the terminal part 1, the image data storage 5, and the image display 8 sequentially from the left, and it is shown that time advances caudad from the upper part of the figure. S11-S16 which were described in a proper place show each operation step. G1-G5 show the frame group GOP 1-5, i.e., dynamic image data for ordinary reproduction, and I2-I4 show the I pictures I20-I40, i.e., dynamic image data for a rapid traverse.
[0030]If fast forwarding reproduction is chosen from a user during ordinary reproduction now, the host CPU 2 of the terminal part 1 will send a control signal for a rapid traverse to the server part 20 via the control signal communications department 3 (S11), The host CPU 2 issues directions of a halt immediately after that at the decode part 6, and makes a display by the image display 8 suspend. The data G2 of the image data storage 5 is canceled almost simultaneously with this (S12). Data in which a slash part of G2 was canceled is shown, and G2 which adjoins a slash part shows data just before being canceled.
[0031]Next, the server part 20 which received a control signal from the control signal communications department 3 switches data transmitting to data for a rapid traverse from GOP data, and transmits it to the terminal part 1. At this time, the reading control part 24 has transmitted to the system-data treating part 4 in order of I3 and I4 within the server part 20 by making the I picture I2 corresponding to a time series (old order), i.e., G2, for data for a rapid traverse into a head.
[0032]The host CPU 2 checks that data for a rapid traverse has been sent by the system-data treating part 4, cancels a halt, carries out the same processing as ordinary reproduction, and displays data for a rapid traverse on the image display 8 (S13).
[0033]If ordinary reproduction is chosen by user as for release of fast forwarding reproduction, the host CPU 2 via the control signal communications department 3, Sending a fast-forwarding-reproduction release signal to the server part 20 (S14) after that, the host CPU 2 makes the decode part 6 suspend a display, and cancels the data I4 of the image data storage 5 (S15).
[0034]Next, the server part 20 changes data transmitting into G4 to the G0P data I4 which is equal to a frame present on display from rapid-traverse data, i.e., I picture, and transmits it to the terminal part 1. And after the host CPU 2 checks that data for ordinary reproduction has been sent by the system-data treating part 4 and cancels a halt, it displays an image for ordinary reproduction on an image display again (S16). And an image for ordinary reproduction of G5 and -- to order is displayed after G4.
[0035]Thus, since a rapid traverse is started by making the I picture I2 corresponding to G2 halted into a head and ordinary reproduction is started by making G4 corresponding to I4 halted into a head, A bond from ordinary reproduction to fast forwarding reproduction and a bond from fast forwarding reproduction to ordinary reproduction can be performed comfortable visually.

[0036]Next, operation of a rewinding reproduction display is already explained. Drawing 5 is a ** type explanatory view already showing operation timing of a rewinding reproduction display. Since meanings, such as the display G, I, and S in the figure, are the same as that of drawing 4, explanation is omitted.
[0037]If rewinding reproduction is already chosen from a user during ordinary reproduction now, the host CPU 2 of the terminal part 1 will already send a control signal for rewinding to the server part 20 via the control signal communications department 3 (S21), The host CPU 2 issues directions of a halt immediately after that at the decode part 6, and makes a display by the image display 8 suspend. The data G7 of the image data storage 5 is canceled almost simultaneously with this (S22). Data in which a slash part of G7 was canceled is shown, and G7 which adjoins a slash part shows data just before being canceled.
[0038]Next, the server part 20 which received the control signal from the control signal communications department 3 already switches data transmitting to the data for rewinding from GOP data, and transmits it to the terminal part 1. At this time, the reading control part 24 has already transmitted to the system-data treating part 4 in order of I5 and I4 from the reverse time series (new order), i.e., G7, within the server part 20 by making the I picture I6 corresponding to the GOP data G6 in front of one for the data for rewinding into a head.
[0039]The host CPU 2 checks that the data for rewinding has already been sent by the system-data treating part 4, cancels a halt, carries out the same processing as ordinary reproduction, and already displays the data for rewinding on the image display 8 (S23).
[0040]If ordinary reproduction is already chosen by the user as for release of rewinding, the host CPU 2 via the control signal communications department 3, Already sending a rewinding release signal to the server part 20 (S24) after that, the host CPU 2 makes the decode part 6 suspend a display, and cancels the data I4 of the image data storage 5 (S25).
[0041]Next, the server part 20 changes data transmitting into the GOP data G6 in front of [of G7 already canceled by S22 from rewinding data] one, and transmits it to the terminal part 1. And after the host CPU 2 checks that the data for ordinary reproduction has been sent by the system-data treating part 4 and cancels a halt, it displays the image for ordinary reproduction on an image display again (S26). And the image for the ordinary reproduction of G7 and -- to order is displayed after G6.
[0042]Thus, since rewinding is already started by making the I picture I6 corresponding to G6 in front of [of Ghalted 7] one into a head and a change to ordinary reproduction from rewinding is already performed from G6 in front of a rewinding start, from ordinary reproduction -- already -- a bond to rewinding reproduction -- and a bond from rewinding reproduction to ordinary reproduction can already be performed comfortable visually.
[0043]Although the number of pictures of GOP was constituted from a 15-sheet lot at this example, it can perform a rapid traverse or already gathering rewinding speed by reducing this number of sheets a rapid traverse or by already being able to lower rewinding speed and increasing the number of sheets of GOP contrary to this.

[Translation done.]

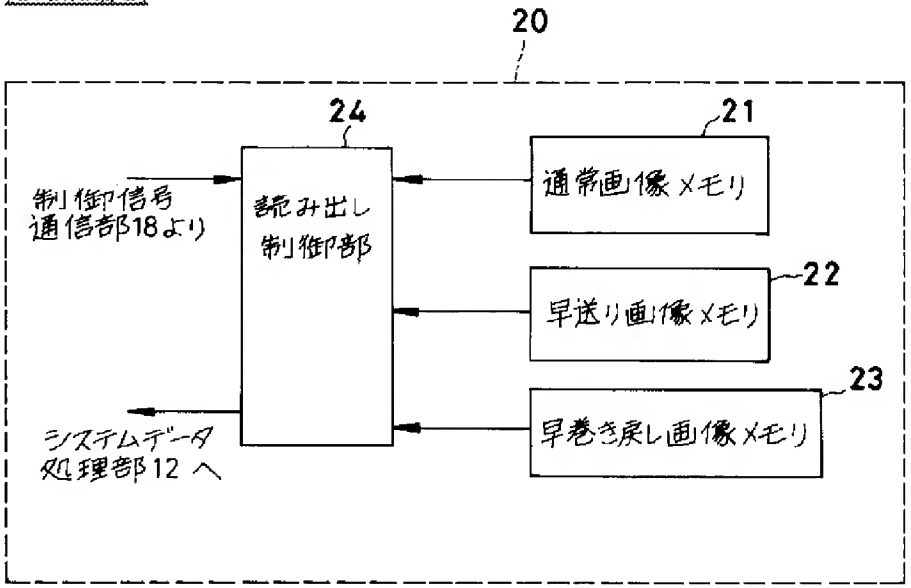
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a block diagram of one embodiment of the fast-forwarding-reproduction equipment of the video concerning this invention.
[Drawing 2]It is a block diagram of one embodiment of the server part of the fast-forwarding-reproduction equipment.
[Drawing 3]It is a ** type explanatory view showing the data structure of the dynamic image data of the fast-forwarding-reproduction equipment.
[Drawing 4]It is a ** type explanatory view showing the operation timing of a fast-forwarding-reproduction display of the fast-forwarding-reproduction equipment.
[Drawing 5]It is a ** type explanatory view of the fast-forwarding-reproduction equipment already showing the operation timing of a rewinding reproduction display.
[Explanations of letters or numerals]
1 Terminal part
2 Host CPU
3 Control signal transmission section
4 System-data treating part
6 Decode part
7 NTSC encoder
8 Image display
20 Multimedia communication server part
21 Usually, an image memory
22 Rapid-traverse image memory
23 It is already a rewinding image memory.
24 Reading control part

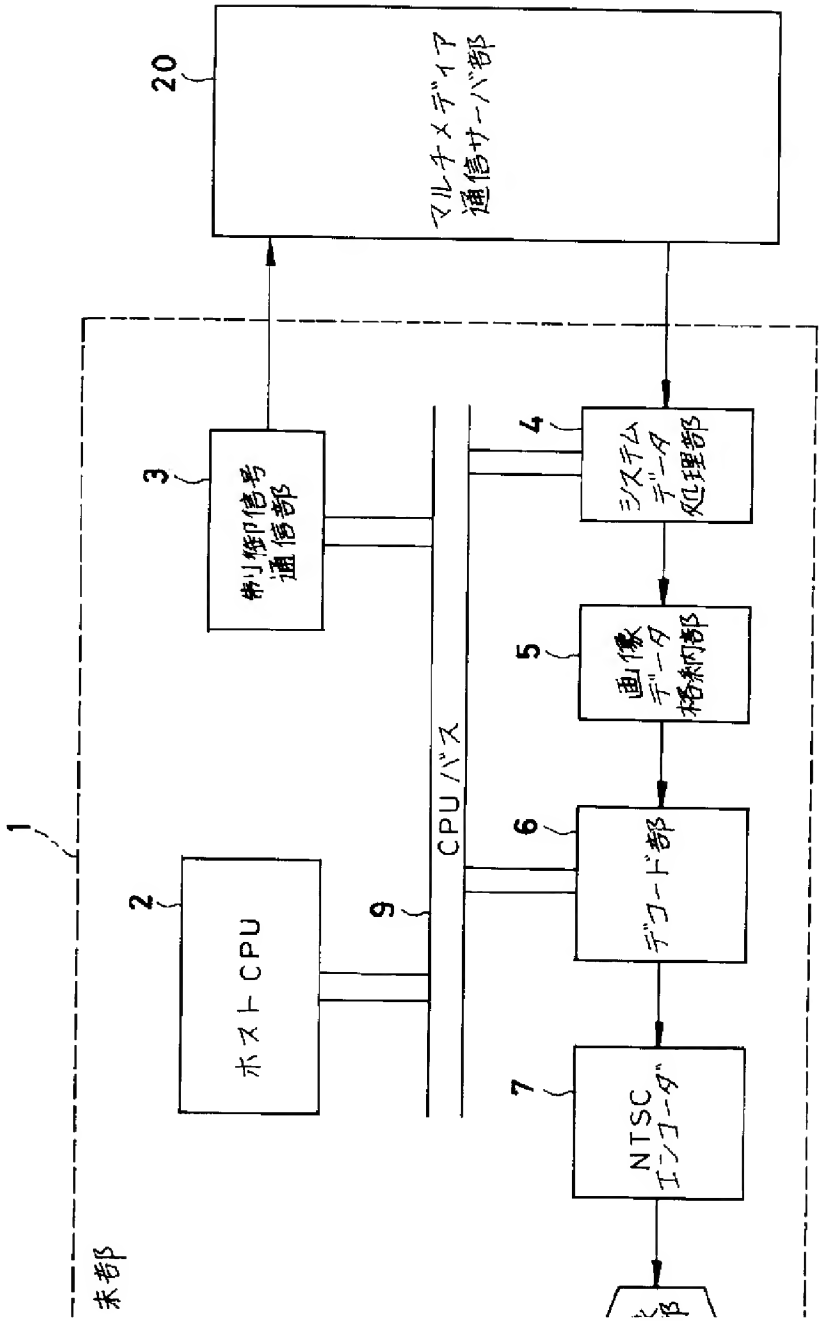
[Translation done.]

DRAWINGS

[Drawing 2]



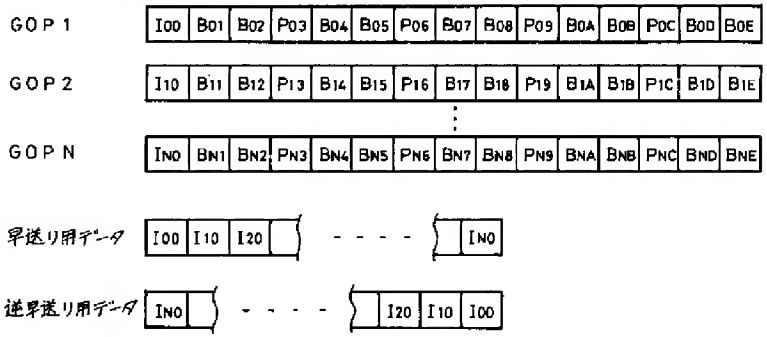
[Drawing 1]


20
マルチメディア
通信サーバ部
3
伸び御信号
通信部
4
システム
データ
処理部
5
画像
データ
伸張部
6
デコード部
7
NTSC
エンコーダ
CPU バス
9
2
ホスト CPU
1
末部

[Drawing 3]

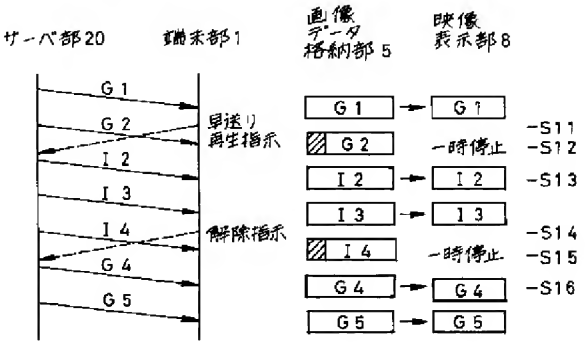
GOP ---Group of Pictures。何枚かの画像データを一まとまりしたデータ構造。
I ---Iピクチャ。フレーム内符号化画像。
P ---Pピクチャ。フレーム間順方向予測符号化画像。
B ---Bピクチャ。フレーム間双方向予測符号化画像。

GOPのピクチャ数＝15。
I,Pピクチャの周期＝3としたとき、

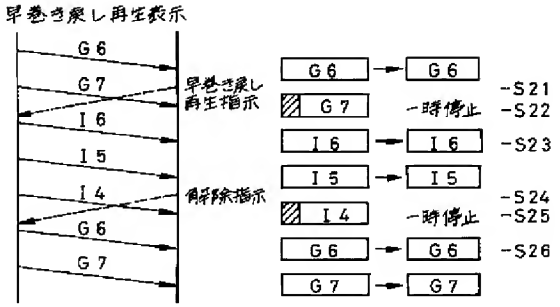


[Drawing 4]

早送り再生表示



[Drawing 5]



[Translation done.]

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	5/92				5/92	Ｈ
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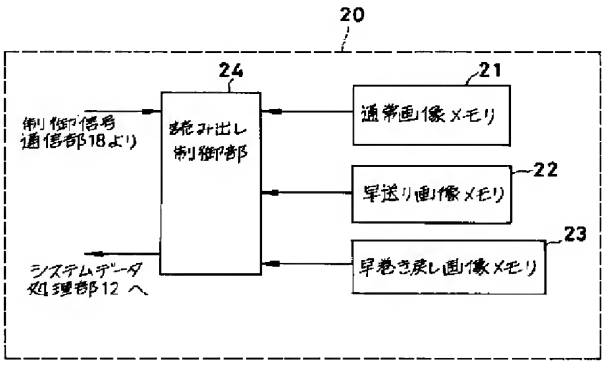
(54)【発明の名称】　動画像の早送り再生装置

(57)【要約】

【目的】　余分なデータの復号化や再生速度に応じてのフレーム選択処理を行う必要のない動画像の早送り再生装置の提供。

【構成】　１つの独立フレームと、これに続く一定数の非独立フレームとからなるフレーム群の連続で形成した通常画像を記憶する通常画像メモリ２１と、これらのフレーム群の連続から独立フレームのみを時系列に配列して記憶する早送り画像メモリ２２と、この独立フレームを逆時系列に配列して記憶する早巻き戻し画像メモリ２３と、端末部１から早送りの指示を受けた場合は早送り画像メモリ２２からデータを読み出し、早巻き戻しの指示を受けた場合は早巻き戻し画像メモリ２３からデータを読み出し、夫々端末部１に映像表示させることにより、早送りおよび早巻き戻し画像が得られる。



【特許請求の範囲】
【請求項１】　フレーム内符号化方式により符号化された独立フレームとフレーム間符号化方式により符号化された非独立フレームとからなる動画像の早送り再生装置であって、少なくとも１つの独立フレームと、それに続く一定数の非独立フレームとからなるフレーム群の連続で形成した通常再生用の動画像データと、前記フレーム群から独立フレームのみを取り出し時系列に配列して形成した早送り用の動画像データと、前記通常再生用および前記早送り用の動画像データを記憶する記憶手段と、この記憶手段から前記通常再生用または前記早送り用の動画像データを選択読み出しする読み出し制御手段とを含むことを特徴とする動画像の早送り再生装置。
【請求項２】　前記動画像の早送り再生装置は、さらに前記フレーム群から独立フレームのみを取り出し逆時系列に配列して形成した早巻き戻し用の動画像データを含み、前記記憶手段は前記早巻き戻し用の動画像データを記憶する機能を含み、かつ前記読み出し制御手段は前記記憶手段から前記通常再生用、前記早送り用または前記早巻き戻し用の動画像データのいずれか１つを選択読み出しする機能を含むことを特徴とする請求項１記載の動画像の早送り再生装置。
【請求項３】　前記読み出し制御手段は前記動画像データをフレームの配列順に読み出す機能を含むことを特徴とする請求項１または２記載の動画像の早送り再生装置。
【請求項４】　前記読み出し制御手段から読み出される動画像データを映像に変換して表示する映像変換手段を含むことを特徴とする請求項１～３いずれかに記載の動画像の早送り再生装置。
【発明の詳細な説明】
【０００１】
【産業上の利用分野】本発明は動画像の早送り再生装置に関し、特に符号化し圧縮した動画像データを復号して早送り再生する動画像の早送り再生装置に関する。
【０００２】
【従来の技術】動画像信号を符号化し圧縮したデータを復号して早送り再生する動画像の早送り再生装置は知られている。
【０００３】従来、画像の符号化方式として、フレーム内符号化方式とフレーム間符号化方式の２つの方式が知られている。フレーム内符号化方式は独立して１フレーム分の信号を符号化するものであるのに対し、フレーム間符号化方式は、前フレームの信号から符号化しようとするフレームの信号を予測して誤差のみを符号化するものである。
【０００４】特に、動画においては連続するフレームの画像データが似ているため、相関関係が非常に強く、フレーム間符号化方式がデータの圧縮には効果的である。
【０００５】しかし、このフレーム間符号化方式は、連続したフレームの中から、ある特定の１フレームを復号しようとした場合、過去のすべてのデータが必要となってしまう。
【０００６】この欠点を解消するため、（１）特開平２－１９２３７８号公報および（２）特開平２－２８５８１６号公報にＭＰＥＧ方式の予測符号化方式が開示されている。
【０００７】これらの予測符号化方式では、予測符号化されたフレームの中に任意の間隔で独立に符号化した独立フレームが挿入されており、予測符号化は前後の独立フレームに基づいて行われる。
【０００８】このＭＰＥＧ方式では、各フレームは、Ｉピクチャー（独立フレーム）、ＰピクチャーおよびＢピクチャー（非独立フレーム）から構成されている。ここで、Ｉピクチャーは独立フレームに相当するので、このピクチャーは独立して符号化される。一方、ＰピクチャーとＢピクチャーは非独立フレームに相当するので独立して符号化することができない。このため、Ｐピクチャーは前のＩピクチャーまたはＰピクチャーに基づいて符号化され、Ｂピクチャーは前後のＩピクチャーまたはＰピクチャーに基づいて符号化される。
【０００９】そして、早送り再生は、連続したフレームの中から一定間隔おきにＩピクチャーのみ、Ｐピクチャーのみ、あるいはＢピクチャーのみを取り出して再生することにより行っていた。
【００１０】また、（３）特開平５－３４４４９４号公報に他のＭＰＥＧ動画像の早送り再生方式が開示されている。
【００１１】この早送り再生方式では、一定間隔おきに所定ピクチャーを取り出して再生するのではなく、一定間隔の所定ピクチャーに近いＩピクチャー（独立フレーム）を選択し、そのＩピクチャーのみを取り出して再生していた。
【００１２】
【発明が解決しようとする課題】しかし、先行技術（１）および（２）は、取り出すフレームがＩピクチャーであれば、そのフレームだけで復号化できるが、ＰピクチャーまたはＢピクチャーであった場合は、復号化のために予測の際に利用した近接フレームも同時に復号化する必要が生じてしまう。
【００１３】また、早送り再生の場合には、連続したフレームの中から早送りの速度倍率に応じて一定の間隔おきに表示すべきフレームを選択する必要が生じる。しかし、この選択すべきフレームの間隔と独立フレームの間隔とが一致するとは限らない。このため、ＭＰＥＧ方式における早送り再生の際には、常に表示すべきフレームのピクチャー数よりずっと多くのピクチャーを復号化し、その中から一定間隔おきのデータを選択して表示しなければならなかった。このため、処理が複雑となり多くの時間がかかるという欠点があった。

【００１４】また、先行技術（３）では、Ｉピクチャー（独立フレーム）のみを取り出すため、先行技術（１），（２）よりも処理の簡単化および処理時間の短縮化が図られているが、表示させたいフレームがＰピクチャーおよびＢピクチャー等の非独立フレームの場合は、その近くのＩピクチャーを表示させるためにＩピクチャーの選択処理を行う必要があり、またこの場合は等間隔の早送り再生にならないという欠点があった。

【００１５】そこで本発明の目的は、余分なデータの復号化や再生速度に応じてのフレーム選択処理を行う必要のない動画像の早送り再生装置を提供することにある。

【００１６】

【課題を解決するための手段】前記課題を解決するために本発明は、フレーム内符号化方式により符号化された独立フレームとフレーム間符号化方式により符号化された非独立フレームとからなる動画像の早送り再生装置であって、少なくとも１つの独立フレームと、それに続く一定数の非独立フレームとからなるフレーム群の連続で形成した通常再生用の動画像データと、前記フレーム群から独立フレームのみを取り出し時系列に配列して形成した早送り用の画像データと、前記通常再生用および前記早送り用の動画像データを記憶する記憶手段と、この記憶手段から前記通常再生用または前記早送り用の動画像データを選択読み出しする読み出し制御手段とを含むことを特徴とする。

【００１７】

【作用】１つの独立フレームと、それに続く一定数の非独立フレームとからなるフレーム群の連続で通常再生用動画像フレームを形成し、このフレームから独立フレームのみを取り出しこれを時系列に配列した早送り用データを記憶手段に記憶させる。そして、早送り再生を行う場合はこの記憶手段より早送り用データを読み出し、通常の動画像再生装置で再生する。

【００１８】

【実施例】以下、本発明の実施例について添付図面を参照しながら説明する。図１は本発明に係る動画像の早送り再生装置の一実施例の構成図である。この動画像の早送り再生装置はマルチメディア通信に用いられる装置で、ユーザにより再生モードが選択され、その選択に応じたモードで動画像の再生が行われる端末部１と、この端末部１からの指示により所定の動画像を端末１に転送するマルチメディア通信サーバ部（以下、サーバ部という。）２０とからなる。

【００１９】また、端末部１は、ユーザの指示に従ってプログラムを実行するホストＣＰＵ２と、ホストＣＰＵ２からの指示に従って所定の再生モードの動画像データをサーバ部２０に転送させるため、サーバ部２０に制御信号を送信する制御信号送信部３と、サーバ部２０から転送されたデータをヘッダー部（タイムコード）、画像、音声等に分別するシステムデータ処理部４と、システムデータ処理部４から出力される画像データを格納する画像データ格納部５と、画像データ格納部５に格納された画像データを復号化するデコード部６と、デコード部６で復号化された画像データをＮＴＳＣ信号に変換するＮＴＳＣエンコーダ７と、ＮＴＳＣエンコーダ７でＮＴＳＣ信号に変換された画像データを表示する映像表示部８と、ホストＣＰＵ２、制御信号送信部３、システムデータ処理部４およびデコード部６間に接続されたＣＰＵバス９とからなる。

【００２０】次に、サーバ部の構成について説明する。図２はサーバ部の一実施例の構成図である。サーバ部２０は、通常再生用の動画像データを記憶する通常画像メモリ２１と、早送り用動画像データを記憶する早送り画像メモリ２２と、早巻き戻し用動画像を記憶する早巻き戻し画像メモリ２３と、制御信号通信部３からの制御信号に従ってこれら３個のメモリ２１～２３のいずれか１個から所定の動画像データを読み出しシステムデータ処理部４に転送する読み出し制御部２４とからなる。

【００２１】なお、図示しないがこれら３個のメモリ２１～２３を読み書き可能メモリ（ＲＡＭ等）で構成し、これらのメモリ２１～２３に所定の動画像データを書き込む公知の書き込み制御部をさらにこのサーバ部２０に備えることにより、最新の動画像データの早送り再生等が可能となる。

【００２２】次に、動画像データのデータ構造について説明する。図３は動画像データのデータ構造を示す模式説明図である。

【００２３】ＧＯＰ１は、１フレーム群を示し、先頭のＩピクチャーＩ００（独立フレーム）と、それから予測符号化されたＰピクチャーＰ０３，Ｐ０６，Ｐ０９，Ｐ０Ｃおよびピクチャー Ｂ０１，Ｂ０２，Ｂ０４，Ｂ０５，Ｂ０７，Ｂ０８，Ｂ０Ａ，Ｂ０Ｂ，Ｂ０Ｄ，Ｂ０Ｅの計１５個のピクチャーで構成される。ここで、ＧＯＰ１のピクチャー数は一般的な数値として１５としているが任意の数でよい。また、Ｉ，Ｐピクチャーの周期は３としてあるがこれも任意の数でよい。

【００２４】この１フレーム群を連続させたもの（ＧＯＰ１，ＧＯＰ２，…ＧＯＰＮ；Ｎは２以上の正の整数）で通常再生用の動画像データが構成される。

【００２５】ここに、ＧＯＰはＧｒｏｕｐ　ｏｆ　Ｐｉｃｔｕｒｅｓの略であり、ＧＯＰは何枚かの画像データを一まとまりにしたデータ構造を意味し、Ｉピクチャーはフレーム内符号化画像を、Ｐピクチャーはフレーム間順方向予測符号化画像を、Ｂピクチャーはフレーム間双方向予測符号化画像を夫々意味する。

【００２６】また、早送り用の動画像データはＧＯＰ１～ＧＯＰＮのデータ内のＩピクチャー（独立フレーム）Ｉ００，Ｉ１０，…ＩＮ０を時系列に連続して配列したものである。

【００２７】そして、早巻き戻し用の動画像データは早

送り用の動画像データを逆にＩＮ０，…，Ｉ１０，Ｉ０の順に配列したものである。

【００２８】次に、動画像の早送り再生装置の動作について説明する。

【００２９】まず、早送り再生表示の動作について説明する。図４は早送り再生表示の動作タイミングを示す模式説明図である。同図は左から順にサーバ部２０、端末部１、画像データ格納部５および映像表示部８の動作タイミングを示し、同図の上方から下方に時間が進行することを示している。また、適所に記したＳ１１～Ｓ１６は各動作ステップを示す。また、Ｇ１～Ｇ５はフレーム群ＧＯＰ１～５、すなわち通常再生用の動画像データを示し、Ｉ２～Ｉ４はＩピクチャーＩ２０～Ｉ４０、すなわち早送り用の動画像データを示す。

【００３０】いま、通常再生中にユーザより早送り再生が選択されると、端末部１のホストＣＰＵ２が制御信号通信部３を介してサーバ部２０に早送り用の制御信号を送り（Ｓ１１）、ホストＣＰＵ２はその直後にデコード部６に一時停止の指示を出し、映像表示部８での表示を一時停止させる。また、これとほぼ同時に画像データ格納部５のデータＧ２を破棄する（Ｓ１２）。Ｇ２の斜線部が破棄されたデータを示し、斜線部に隣接するＧ２は破棄される直前のデータを示す。

【００３１】次に、制御信号通信部３より制御信号を受けたサーバ部２０は、転送データをＧＯＰデータから早送り用データに切り換え、端末部１に転送する。この時、サーバ部２０内では読み出し制御部２４が、早送り用のデータを時系列（古い順）に、すなわち、Ｇ２に対応するＩピクチャーＩ２を先頭として、Ｉ３，Ｉ４の順にシステムデータ処理部４に転送している。

【００３２】また、ホストＣＰＵ２は、システムデータ処理部４にて早送り用のデータが送られてきたことを確認し、一時停止を解除し、早送り用データを通常再生と同じ処理をして映像表示部８に表示する（Ｓ１３）。

【００３３】また、早送り再生の解除は、ユーザにより通常再生が選択されるとホストＣＰＵ２が制御信号通信部３を介して、サーバ部２０に早送り再生解除信号を送り（Ｓ１４）、ホストＣＰＵ２は、その後、デコード部６に表示を一時停止させ、画像データ格納部５のデータＩ４を破棄する（Ｓ１５）。

【００３４】次に、サーバ部２０は、転送データを早送りデータから現在表示中のフレームに匹敵するＧ０Ｐデータ、すなわち、ＩピクチャーＩ４に対するＧ４に変更し端末部１に転送する。そして、ホストＣＰＵ２は、システムデータ処理部４にて通常再生用のデータが送られてきたことを確認し、一時停止を解除した後、映像表示部に再び通常再生用の映像を表示させる（Ｓ１６）。そして、Ｇ４に次いでＧ５、…の順に通常再生用の映像が表示される。

【００３５】このように、一時停止したＧ２に対応するＩピクチャーＩ２を先頭として早送りが開始され、一時停止したＩ４に対応するＧ４を先頭として通常再生が開始されるため、通常再生から早送り再生へのつなぎ、および早送り再生から通常再生へのつなぎを視覚的に違和感なく行うことができる。

【００３６】次に、早巻き戻し再生表示の動作について説明する。図５は早巻き戻し再生表示の動作タイミングを示す模式説明図である。なお、同図中の表示Ｇ、Ｉ、Ｓ等の意味は図４と同様なため説明を省略する。

【００３７】いま、通常再生中にユーザより早巻き戻し再生が選択されると、端末部１のホストＣＰＵ２が制御信号通信部３を介してサーバ部２０に早巻き戻し用の制御信号を送り（Ｓ２１）、ホストＣＰＵ２はその直後にデコード部６に一時停止の指示を出し、映像表示部８での表示を一時停止させる。また、これとほぼ同時に画像データ格納部５のデータＧ７を破棄する（Ｓ２２）。Ｇ７の斜線部が破棄されたデータを示し、斜線部に隣接するＧ７は破棄される直前のデータを示す。

【００３８】次に、制御信号通信部３より制御信号を受けたサーバ部２０は、転送データをＧＯＰデータから早巻き戻し用データに切り換え、端末部１に転送する。この時、サーバ部２０内では読み出し制御部２４が、早巻き戻し用のデータを逆時系列（新しい順）に、すなわち、Ｇ７より１つ前のＧＯＰデータＧ６に対応するＩピクチャーＩ６を先頭として、Ｉ５，Ｉ４の順にシステムデータ処理部４に転送している。

【００３９】また、ホストＣＰＵ２は、システムデータ処理部４にて早巻き戻し用のデータが送られてきたことを確認し、一時停止を解除し、早巻き戻し用データを通常再生と同じ処理をして映像表示部８に表示する（Ｓ２３）。

【００４０】また、早巻き戻しの解除は、ユーザにより通常再生が選択されるとホストＣＰＵ２が制御信号通信部３を介して、サーバ部２０に早巻き戻し解除信号を送り（Ｓ２４）、ホストＣＰＵ２は、その後、デコード部６に表示を一時停止させ、画像データ格納部５のデータＩ４を破棄する（Ｓ２５）。

【００４１】次に、サーバ部２０は、転送データを早巻き戻しデータからＳ２２で破棄されたＧ７の１つ前のＧＯＰデータＧ６に変更して端末部１に転送する。そして、ホストＣＰＵ２は、システムデータ処理部４にて通常再生用のデータが送られてきたことを確認し、一時停止を解除した後、映像表示部に再び通常再生用の映像を表示させる（Ｓ２６）。そして、Ｇ６に次いでＧ７、…の順に通常再生用の映像が表示される。

【００４２】このように、一時停止したＧ７の１つ前のＧ６に対応するＩピクチャーＩ６を先頭として早巻き戻しが開始され、早巻き戻しから通常再生への切り換えは早巻き戻し開始直前のＧ６から行われるため、通常再生から早巻き戻し再生へのつなぎ、および早巻き戻し再生

から通常再生へのつなぎを視覚的に違和感なく行うことができる。

【００４３】なお、本実施例ではＧＯＰのピクチャー数を１５枚一組で構成したが、この枚数を減らすことにより早送りまたは早巻き戻し速度を下げることができ、これとは逆にＧＯＰの枚数を増やすことにより早送りまたは早巻き戻し速度を上げることができる。

【００４４】

【発明の効果】本発明によれば、少なくとも１つの独立フレームと、それに続く一定数の非独立フレームとからなるフレーム群の連続で形成した通常再生用の動画像データと、前記フレーム群から独立フレームのみを取り出し時系列に配列して形成した早送り用の動画像データと、これらの両データを記憶する記憶手段と、この記憶手段からいずれか一方のデータを読み出す読み出し制御手段とを設けたため、早送りする場合は記憶手段から早送り用の動画像データを読み出し、その読み出したデータをそのまま通常再生用の装置で処理することにより早送り再生を行うことができる。また、等間隔の早送り再生も容易に行うことができる。

【００４５】したがって、余分なデータの復号化や再生速度に応じてフレーム選択処理を行う必要がなくなるため、回路規模の縮小化および再生画像の鮮明化を図ることができる。

【図面の簡単な説明】

【図１】本発明に係る動画像の早送り再生装置の一実施例の構成図である。

【図２】同早送り再生装置のサーバ部の一実施例の構成図である。

【図３】同早送り再生装置の動画像データのデータ構造を示す模式説明図である。

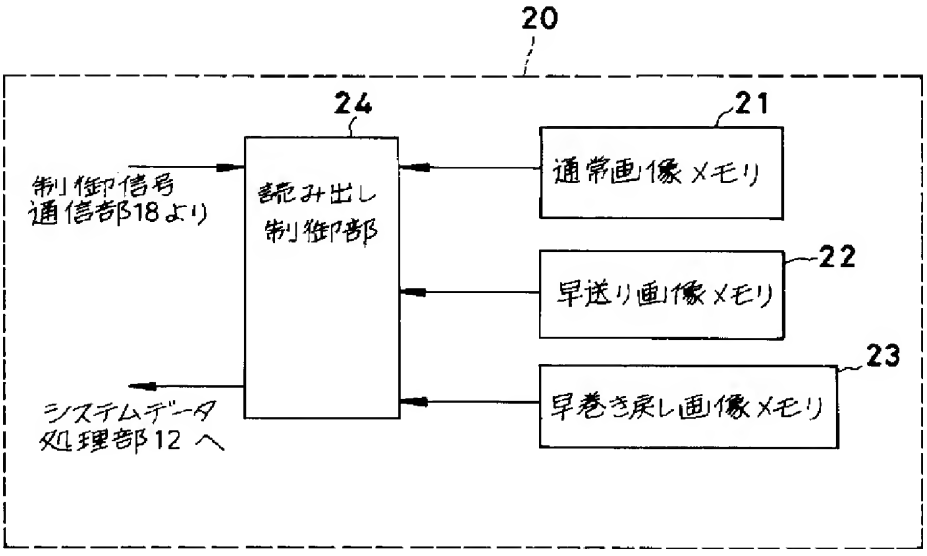
【図４】同早送り再生装置の早送り再生表示の動作タイミングを示す模式説明図である。

【図５】同早送り再生装置の早巻き戻し再生表示の動作タイミングを示す模式説明図である。

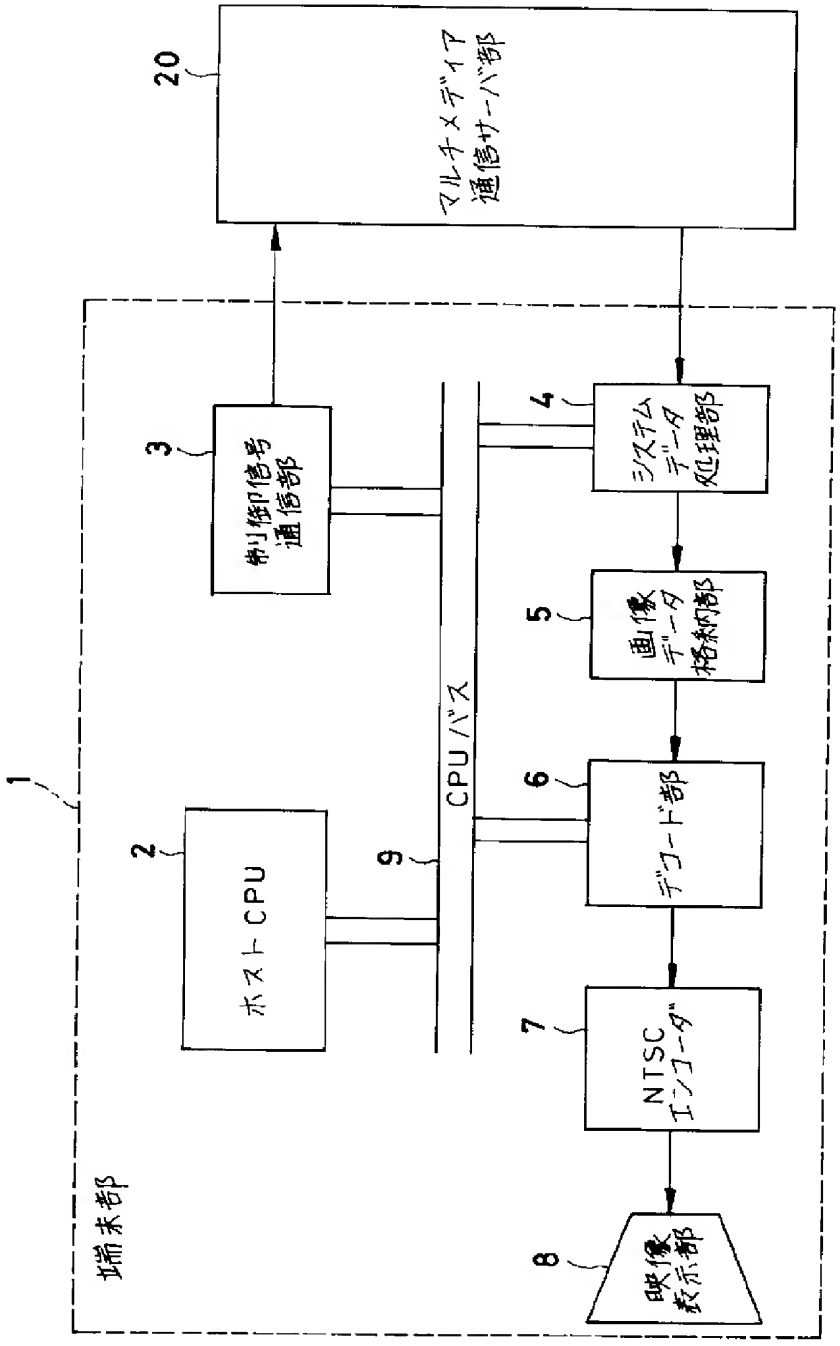
【符号の説明】

１　端末部
２　ホストＣＰＵ
３　制御信号送信部
４　システムデータ処理部
６　デコード部
７　ＮＴＳＣエンコーダ
８　映像表示部
２０　マルチメディア通信サーバ部
２１　通常画像メモリ
２２　早送り画像メモリ
２３　早巻き戻し画像メモリ
２４　読み出し制御部

【図２】



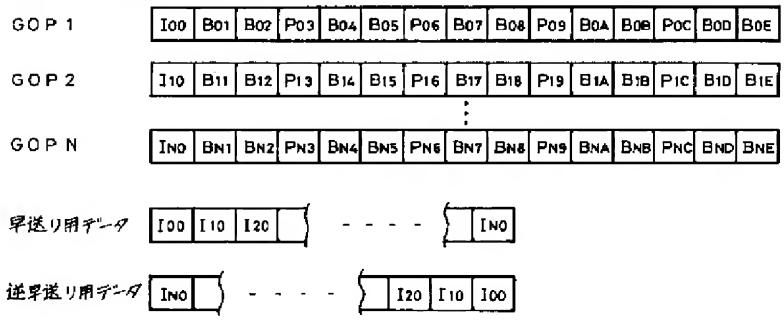
【図１】


20
マルチメディア
通信サーバ部
3
制御信号
通信部
4
システム
データ
処理部
5
画像
データ
格納部
6
デコード部
7
NTSC
エンコーダ
8
映像
表示部
1
端末部
2
ホストCPU
9
CPUバス

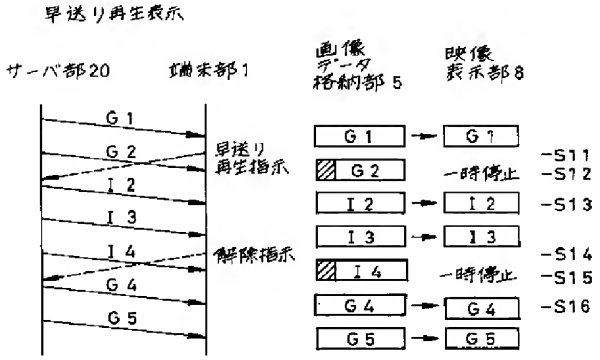
【図３】

GOP ---Group of Pictures。何枚かの画像データを一まとまりにしたデータ構造。
I　---Iピクチャ。フレーム内符号化画像。
P　---Pピクチャ。フレーム間順方向予測符号化画像。
B　---Bピクチャ。フレーム間双方向予測符号化画像。

GOPのピクチャ数＝15。
I，Pピクチャの間隔＝3としたとき、



【図４】



【図５】